HPMS 2010+
Webinar Conference Series

Webinar #2:

HPMS 2010+ Geospatial Data Requirements

March 25, 2010

Housekeeping

- Please mute your phone during the presentation
- Use the chat box to enter questions/comments
- There will be a question and answer period toward the end of the webinar and you will be prompted to un-mute your phone at that time

Acronyms Used

- ARRA = American Recovery and Reinvestment Act of 2009
- CSV = Comma-separated values
- DOT = Department of Transportation (in this presentation State only)
- GIS = Geographic Information System
- LRS = Linear Referencing System (geospatial)
- NHPN = National Highway Planning Network
- NHS = National Highway System
- SQL = Structured Query Language (in this presentation used to identify a type of database system)

Field Manual Synopsis

- Referenced Material:
  - Field Manual ’05, Field Manual ‘08 (draft)
  - Data Specifications Document ‘09
  - Spring ‘09 Webinar Conference
- Structure
  - 7 Chapters
  - 10 Appendices
  - Diagrams, Figures, Reference Tables

Geospatial Information and HPMS

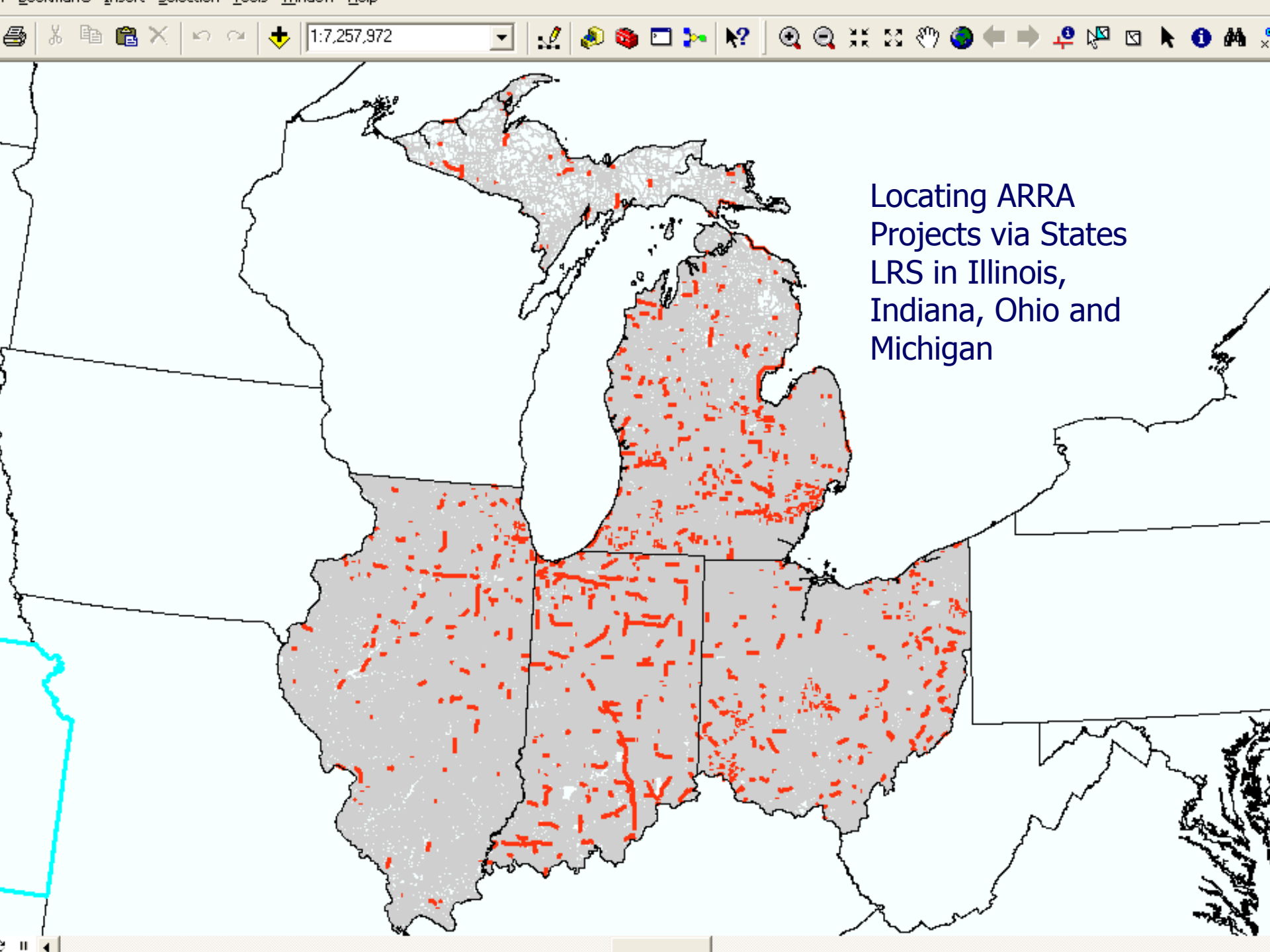
1. HPMS, The GIS/LRS Evolution
2. The HPMS GIS/LRS Approach
3. HPMS 2010+ Requirements
4. Geospatial Data Validations
5. 2010 (2009 Data Year) Expectations
6. Questions/Answers/Discussion

HPMS, The GIS/LRS Evolution

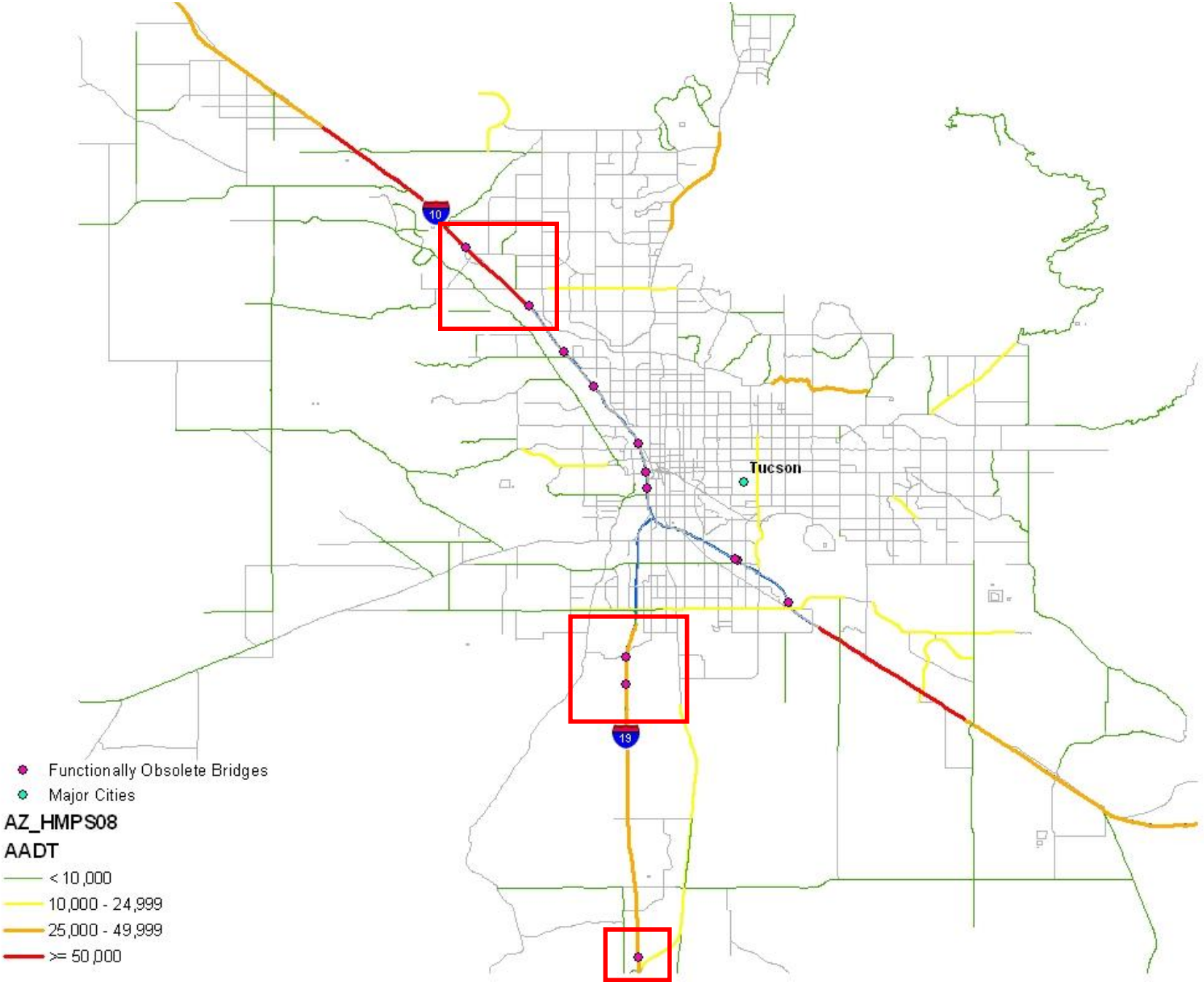
- HPMS was intended to be spatially enabled for HPMS 2010+
- Federally-based GIS/LRS highway systems are difficult to build and impossible to maintain
  - Replaces old HPMS LRS
  - Augment or generate the NHPN
  - Develop Functional Classification Maps

HPMS, The GIS/LRS Evolution (Continued)

- A need to analyze, report and map non-HPMS information such as ARRA projects
- Analysis and display of HPMS and other related information for Transportation Stakeholders


1:7,257,972
Locating ARRA Projects via States LRS in Illinois, Indiana, Ohio and Michigan

Identifying Sections with Functionally Obsolete Bridges and AADT >= 25K



HPMS, The GIS/LRS Evolution (Continued)

- State DOT Synergy
  - Some States maintain a LRS that includes Local Roads
  - Many States maintain a LRS that includes all Federal-aid roads
  - Most States maintain a LRS that represents designated State routes

HPMS, The GIS/LRS Evolution (Continued)

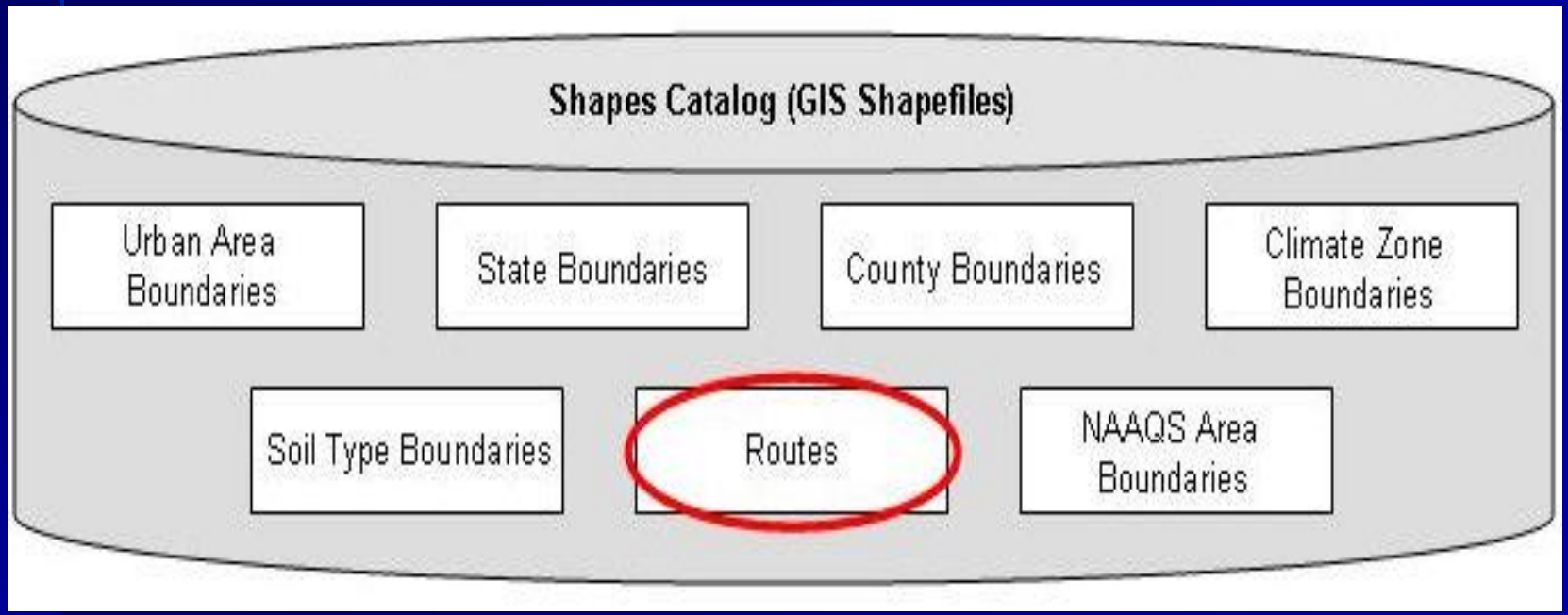
- A Mature Technology
  - A few States have maintained a LRS in a geospatial environment for 30 years
  - In the 1980's and 90's LRS's were developed by several other State DOTs
  - Technology became very mature in the 2000's

The HPMS LRS/GIS Approach

- FHWA's LRS is the State's LRS
  - LRS Key (Route ID) is what a State DOT uses to uniquely identify a road, i.e. the DOT Enterprise Standard
  - Measures are based on the State DOT's internal methodology
  - At a minimum, the LRS will include all Federal-aid roads (NHS and all roads functionally classified other than rural minor collector and local)

The Requirements

The State DOT provides a "Routes" GIS Shapefile (FHWA is investigating other software and methodologies for importing geospatial data)



The LRS/GIS Requirements

- Single Centerline or Dual Carriageway
- Resolution - 1:100,000 or finer
- Datum - North American Datum (NAD)-83
- Projection - Longitude/Latitude (Unprojected)
- Units - Decimal Degrees
- Measures - Miles
- File Format – Shapefile, CSV (FHWA will store the Routes file in SQL Server)

The LRS Requirements (Continued)
HPMS Routes Dataset Structure

ROUTES TABLE				
Constraint	Field Name	Data Type	Description	Valid Values
PK	Year of Record	Numeric(4)	Year for which the data apply	The four digits of the year that the data represents.
PK	ST Code	Numeric(2)	State FIPS code	Up to two digits for the FIPS code. See Appendix C for a complete list.
PK	Route ID	VarChar(60)	ID for the linear feature	Up to 60 alpha-numeric digits that identify the route. This ID must be unique within the State.
	Comment (optional)	Text(50)	Text descriptor for the route	Up to 50 text characters to be used for specifying an English descriptor for the route (e.g. Interstate 70, I-70, I-70 from Exit 2 to Exit 4, etc.).
	Shape	Geometry	Line feature	This field is automatically generated when the State's shapefile is developed.Coordinates for geometries have 3 dimensions – Longitude(x), Latitude(y), and Measure/Station (m). The shapefile is expected to contain lines with valid X, Y, and M points.

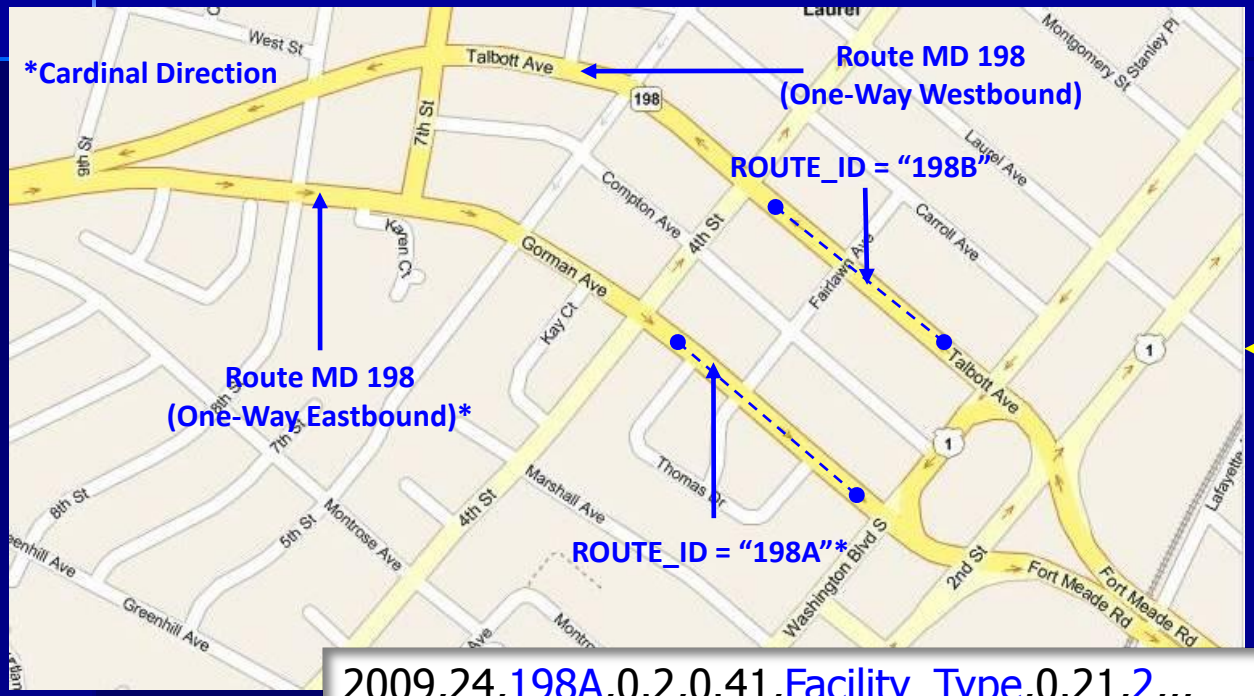
The LRS Requirements (Continued)

- Valid values: CSV file containing Year of Record, State Code, and Route ID values for each line feature. Route ID must be unique within the State.
- Extent: All Federal-aid highways and ramps located within grade-separated interchanges
  - i.e., NHS, and all functional systems excluding rural minor collectors and locals. Will accept a LRS that includes non-federally aided routes if available

"Couplets"

- Parallel roadways that have the same route designation (e.g., Route 1), but different street names (e.g., West Avenue, and East Avenue);
- Typically located in an urban area or a city/town;
- Usually connects to roadways with two-way traffic;
- Are typically separated by some physical or visual element other than a curb or barrier, such as buildings, landscaping, or terrain;
- Parallel roadways which compliment each other in providing access at both termini; and
- Not designated as an Interstate

"Couplets" (Continued)



Section data must be reported for **BOTH** sides of a couplet.

```
2009,24,198A,0.2,0.41,Facility_Type,0.21,2,,,
2009,24,198B,0.2,0.41,Facility_Type,0.21,3,,,
2009,24,198A,0.2,0.41,AADT,0.21,10000,Factored '07 AADT,,
2009,24,198B,0.2,0.41,AADT,0.21,8000,Factored '07 AADT,,
2009,24,198A,0.2,0.41,Through_Lanes,0.21,3,,,
2009,24,198B,0.2,0.41,Through_Lanes,0.21,2,,,
```

HPMS

State Boundaries Dataset Structure (provided by FHWA)

STATE BOUNDARIES TABLE			
Constraint	Field Name	Data Type	Description
PK	ST Code	Numeric(2)	State FIPS code
	ST Abbrev	Text	State abbreviation
	ST Name	Text	State name
	Shape	Geometry	Polygon feature

Urban Area Boundaries (provided by FHWA unless adjusted)

URBAN AREA BOUNDARIES TABLE			
Constraint	Field Name	Data Type	Description
PK	Year of Record	Numeric(4)	Year for which the data apply
PK	Urban Code	Numeric(5)	Census urban code
	Urban Name	Text	Urban name
	Census Pop	Numeric(8)	Census population
	Census Land Area	Numeric(4)	Census land area (in square miles)
	Shape	Geometry	Polygon feature

NAAQS Area Boundaries (provided by FHWA)

NAAQS AREA BOUNDARIES TABLE			
Constraint	Field Name	Data Type	Description
PK	Year of Record	Numeric(4)	Year for which the data apply
PK	NAAQS Code	Numeric(5)	NAAQS/Urban code
	NAAQS Area Name	Text	NAAQS/Urban name
PK	Pollutant Type	Numeric(1)	Pollutant
	Shape	Geometry	Polygon feature

HPMS Expectations for 2010

- Good faith effort to submit as much data as possible in the new format in 2010 (2009 data year)
  - May opt to make the official submittal in the previous HPMS format, if necessary
- Submit LRS/GIS in the new format for the 2010 submittal, i.e. June 15, 2010.

Questions/Comments

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